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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,895	10/11/2001	Mun Geon Kyeong	11349-P67202US0	8943
43569	7590	10/28/2005	EXAMINER	
MAYER, BROWN, ROWE & MAW LLP 1909 K STREET, N.W. WASHINGTON, DC 20006			KIM, KEVIN	
			ART UNIT	PAPER NUMBER
			2638	

DATE MAILED: 10/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/973,895

Applicant(s)

KYEONG ET AL.

Examiner

Kevin Y. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16-30 is/are allowed.
- 6) ☒ Claim(s) 1-3,8-10,31,32 and 36 is/are rejected.
- 7) ☒ Claim(s) 4-7,11-15 and 33-35 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3,8-10,31,32,36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gifford et al (6,836,507) in view of Kitade et al (US 6,134,262, cited by Applicant).

Claims 1,8, 31 and 36.

Gifford et al discloses a space-time receiving system where a chip-level beamforming algorithm is applied (see Fig. 7), comprising;

a digital beam forming network (112) for forming beams of signal received through a plurality of antennas by spatial-filtering the signal to thereby generate a spatial-filtered signal,

a demodulation means (120 – 132) for demodulating the spatial-filtered signal to generate demodulated signal,

correlating means (102) in the demodulation means for estimating a fading channel based on a pilot channel signal,

a hard limiter (116)

a reference generation means for generating a reference signal (130) based on the output signal from the correlation means (102) and

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a weight vector estimating means (124) for generating weight vector based on the reference signal (130) and the received signal (113B) for providing the weight vector to the digital beam forming network.

Gifford et al fails to teach "Doppler frequency estimating means" and "correlation length selection means" based on the "Doppler frequency estimating means." Kitade et al teaches a receiving circuit (see Fig.1) having a Doppler frequency prediction means (104) based on pilot signal and a correlation length changing means (105) for changing the correlation length based on the result of the Doppler frequency prediction means for the purpose of more accurately detecting the pilot signal. See col. 6, lines 50-52. Thus, it would have been obvious to one skilled in the art at the time the invention was made to include a Doppler frequency prediction means and a correlation length changing means to the receiver of Gifford et al in order to better detect a pilot signal, as taught by Kitade et al.

Furthermore, providing a plurality of identical receivers with time offset, i.e., a Rake receiver is well known in the art, as admitted in Fig.1 of the present application. Thus, it would have been obvious to one skilled in the art at the time the invention was made to provide a plurality of receivers as disclosed by Gifford et al and modified by the teaching of Kitade et al in a Rake receiver structure to benefit from diversity reception.

Claims 2, 9 and 32.

The use of MMSE algorithm and a recursive least square algorithm are well known for estimating weight vectors. See page 3 of the application.

Claims 3, 10.

Fig.5 of Kitada et al shows the Doppler frequency estimation based on previous fading channel information stored on buffers (602) and current fading channel information.

***Allowable Subject Matter***

3. Claims 4-7, 11-15, 33-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. Claims 16-30 are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y. Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**KEVIN KIM**  
**PATENT EXAMINER**